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EXAMINER	
FLETCHER, MARLON T	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/646,849
Filing Date: October 17, 2000
Appellant(s): ISHIDA ET AL.

Jeffrey Canfield
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 06/07/2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1, 3, 4, 6, 9, and 11-30, stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

4807153	Onaga et al.	2-1989
6222338	Villaret	4-2001
5245263	Tsai et al.	9-1993
6064167	Takenaka et al.	5-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1, 3, 4, 6, 8, 9, 11-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onaga et al. (4,807,153) in view of Tsai et al. (5,245,263), Villaret (6,222,338) and Takenaka et al. (6,064,167).

As recited in claims 1, 4, 6, 9, and 23-30, Onaga et al. disclose a robot device and control method including a joint mechanism control apparatus and method as seen in figures 1 and 2 and as discussed in column 5, lines 5-8, having an actuator for

generating a rotation torque whose level depends on a drive current, connecting a first link to a second link as freely rotating on an predetermined axis, and rotating the first link on the predetermined axis based on the rotation torque output from the actuator through an output axis of the actuator as discussed in column 4, lines 36-45, characterized by comprising: electric current detection means for detecting an electric current value of the drive current of the actuator as discussed in column 6, lines 5-18, lines 48-57, column 7, lines 60-64, column 16, lines 31-34, and column 18, lines 47-62; and external force torque detection means for detecting a level of a torque by an external force applied to the output axis of the actuator based on the electric current value detected by said electric current detection means as discussed in column 6, lines 5-18, column 6, line 58 through column 7, line 2, column 15, line 30 through column 16, line 30, and column 18, lines 47-62.

Onaga et al. disclose the robot device and method including the joint mechanism control apparatus and method, characterized by further comprising: control means for controlling the actuator based on a detection result from said external force torque detection unit such that the external force applied to the output axis of the actuator can be removed as discussed in column 6, line 58 through column 7, line 2, column 15, lines 32-54, and column 16, lines 7-30.

As recited in claims 3, 8, and 14-17, Onaga et al. disclose the robot device and method including the joint mechanism control apparatus and method, characterized in that: said actuator comprises: a motor unit generating the rotation torque depending on a supplied drive current as discussed in column 6, lines 5-15; a torque amplification unit

(174, 150) amplifying the rotation torque generated by said motor unit, and transmits the torque to said output axis as discussed in column 6, lines 8-15 and lines 58-65; and motor control means for controlling said motor unit by supplying said motor unit with the drive current at a level according to externally provided control information, and said motor control unit is provided in said motor unit as discussed in column 6, lines 11-15 and lines 48-57, column 8, lines 11-14, and column 15, lines 32-45.

As recited in claims 11, 13, and 18-30, Onaga et al. disclose a robot device and method having characterized by comprising: an actuator, provided in a joint mechanism, generating a rotation torque whose level depends on a drive current for rotation-driving said arm unit on a predetermined axis; electric current detection means for detecting an electric current value of the drive current of the actuator as discussed in column 6, lines 5-18, lines 48-57, column 7, lines 60-64, column 16, lines 31-34, and column 18, lines 47-62; and external force torque detection means for detecting a level of a torque by an external force applied to the output axis of the actuator based on the electric current value detected by said electric current detection means as discussed in column 6, lines 5-18, column 6, line 58 through column 7, line 2, column 15, line 30 through column 16, line 30, and column 18, lines 47-62; and control means for controlling the actuator based on a detection result from said external force torque detection unit such that the external force applied to the output axis of the actuator can be removed as discussed in column 6, line 58 through column 7, line 2, column 15, lines 32-54, and column 16, lines 7-30.

As recited in claim 12, Onaga et al. disclose the robot device, characterized in that: said actuator comprises: a motor unit generating the rotation torque depending on a supplied drive current as discussed in column 6, lines 5-15; a torque amplification unit (174, 150) amplifying the rotation torque generated by said motor unit, and transmits the torque to said output axis an as discussed in column 6, lines 8-15 and lines 58-65; and motor control means for controlling said motor unit by supplying said motor unit with the drive current at a level according to externally provided control information, and said motor control means is provided in said motor unit as discussed in column 6, lines 11-15 and lines 48-57, column 8, lines 11-14, and column 15, lines 32-45.

Onaga et al. do not teach the actuator including a current detector, a torque detector, and control means. Onaga et al. further do not disclose a pair of leg units in each of which a lower leg unit is connected to a thigh unit through a knee joint mechanism, and a foot unit is connected to the lower leg unit through an ankle joint mechanism.

However, Tsai et al. disclose an actuator (2 and 3) including control means as well as current (inherent) and torque detectors as discussed in column 9, lines 3-19 and as seen in figure 3.

Villaret is provided to more clearly show the use of torque detectors and current detectors, along with the motor, all included in an actuator case (31), wherein the actuator (31) is the controller as seen in figure 3, wherein the actuator can be used in conjunction with a robot as discussed in column 1, lines 13-17 and column 6, lines 17-24.

Takenaka et al. are provided to show the well known elements in the art, that robots comprise leg units which include a lower leg, a knee joint mechanism, a foot, and an ankle.

It would have been obvious to one of ordinary skill art at the time of the invention to utilize the teachings of Tsai et al., Villaret, and Takenaka et al. with the apparatus of Onaga et al., because Tsai et al., Villaret, and Takenaka et al., enhance the apparatus of Onaga et al. by providing the operating joint or motor with controller for controlling that joint, wherein current and torque is detected to provide control by the actuators to the joints, which inherently reduces wiring. In combination, it is believed that every element recited in the claims are met by the references. All of the references are related to the robot art and therefore, can be combined.

(11) Response to Argument

It is believed that the above rejection, provides the teachings of the present invention, wherein Onaga et al. provide all of the elements claimed, but fails to provide all the elements included in the actuator or actuator case. Tsai et al. provide the actuator including the controller and the motor, wherein torque is detected, which inherently provides a detection of current. However, Villaret is provided to show that the torque sensor, as well as the current sensor, can be provided in the actuator or actuator case for providing control of the actuator. In use in the robot art, the combination would avoid the compliance problem with transmission lines as taught in Tsai et al. (column 9, lines 4-7) which provides less wiring. Tsai et al. show a reduction of wiring in figure 3,

wherein the controller and motor are provided together. The applicant argues that Villaret shows the servo controller containing the elements and not the motor or actuator. However, a servo controller or mechanism can be considered an actuator, wherein the servo comprises the motor and the elements cited above used in controlling the motor, wherein all of the elements are in one case or part (31) as seen in figure 3. The applicant argues that the servo controller is not considered to be the actuator and it a is a separate component as seen in figure 2. The examiner agrees that in view of figure 2, the elements (motors and encoders) are separate. However, as seen in figure 3, the servo (actuator 31) contains the motor and encoders as seen in the block diagram. Further the reference discusses (column 6, lines 44-51) that the components can be integrated into one unit. The servo (31) clearly can be considered an actuator. As stated by the applicant "when claim terms are not defined by the specification, the words of must be given there plain meaning." While applicant is arguing a housing type actuator containing the specific elements, the claims do not recite a housing. In view of claims 1 and 3, the actuator includes a motor. In the examiner's view, the broadly written claims do not define over prior art. In combination, the reference provide the teachings of the claim recitations.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,
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MTF
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